Underwater Park Management

Bruce Higgins
Marine Concepts

Abstract

In a quest to protect marine resources, one available option is the creation of underwater parks. The City of Edmonds created the Edmonds Underwater Park at Bracketts Landing in 1970. This no-harvest area has not only protected marine life by city ordinance, but allows divers to see and enjoy a diverse ecosystem. The success of the park is due in part to the management plan used to operate the park. The park's 25 acres of sub-tidal and two acres of uplands can be one possible local model to evaluate a protected area that has recovered nicely from degradation.

The details of park management are explained and contrasted with a 1996 effort with the City of Seattle and a 1995–1997 effort with Washington State Parks. Strengths and weakness of the different management plans and styles provide direction to groups interested in cooperative efforts that include marine resource protection. The project's pace is described, since coordination with the marine environment can be a factor in understanding success and response. Changes in management and other City of Edmonds policies have affected the park and the health of the marine life. Only by long-term evaluation can progress be made.

Beach Monitoring and Beach Nourishment for Surf Smelt Spawn Habitat Mitigation at Lummi Indian Reservation

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Abstract

A beach-monitoring program was initiated in the fall of 1996 at the Lummi Indian Reservation, near Bellingham, Washington. Monitoring began prior to upcoming major coastal road repairs and improvements that will include more than 9,000 lineal feet of new rock revetment constructed by the Army Corps of Engineers, Seattle District. A physical monitoring program was designed to allow tribal resource managers to try to mitigate negative effects of shore armoring on existing surf smelt (*Hypomesus pretiosus*) spawn habitat, as well as on sand lance (*Ammodytes hexapterus*) spawn habitat and eel grass (*Zostera marina*) beds. A beach nourishment plan was developed to replace surf smelt spawn substrate that will no longer be provided by mass wasting and erosion of bluffs, following construction of the revetment and buttress fill, and to try to mitigate direct and indirect negative impacts caused by the revetment. A biological monitoring program was initiated prior to the physical monitoring to better understand the extent, timing, and variability of surf smelt spawning in the study area. The study area contains a gravel beach that is subjected to moderate energy wave attack during predominant southerly wind events, as well as to excessive shallow groundwater drainage through clay-rich glacial deposits. Average bluff crest retreat rates have been estimated at 4.2 inches/year.

Physical monitoring consists of biannual beach profiling and sediment sampling at 14 stations. Beach profiles are measured at the end of the summer and the end of winter using a total station theodolite. Selected profiles are also monitored following storms. Profiles are measured from monuments located below the beach surface in the narrow backshore area near the bluff toe. Sediment samples are collected from each profile at three fixed tidal elevations in the upper intertidal zone, within the potential surf smelt spawn habitat band. A portion of the sediment samples was analyzed for grain size and others were archived for possible later use. Detailed vertical sediment characterization was performed at selected profiles where spawning has occurred.

Preliminary profile results from fall 1996 and 1997 show mixed beach response along shore, erosion in several areas, and little net change elsewhere. Upper-intertidal beach sediment varied considerably.

Complexities of the system studied directly affect the stability of the beach and bluff and complicate analysis. Complexities include variable bluff retreat rates that are controlled by intermittent occurrence of glacial deposits of the bluff (which influences drainage, bluff stability, and input of suitable grain size sediment to the beach), different exposure to waves, and amount and type of existing shore armoring. Weather during the winter of 1996–97 was unusually severe, with above average precipitation, an extreme runoff event caused by excessive rain on approximately 28 inches of snow, and high intensity of both southerly and northerly wind storms. While wave attack during higher high water was above average during the winter, substantial beach erosion occurred only at the area exposed to wind waves from the north. This area experienced much less mass wasting of the bluff, and therefore had much less sediment input to the beach. Monitoring will continue and results will direct future beach nourishment efforts while our understanding of the system improves. More years of data are clearly required.

7A: Protection of Marine Habitats

Questions & Answers

A: [In response to an unrecorded question:] I think the short answer to your question is yes. But I may be premature in saying that. We certainly have lots of oceanographic data, especially for the Strait of Georgia, and in conducting the work that I hope to do over the next two years, conducting a feasibility study for a proposed national marine conservation area in the southern Strait of Georgia, which is essentially equivalent to the National Marine Sanctuaries Program, we have lots of oceanographic data—current and temperature, salinity, all of that type of information—that we will use. I'm not an ocean scientist myself so we'll have to hire someone to tell us what it means, but do we want to take that holistic ecological approach to establishing a true network on an ecological basis, the answer is yes. How successful we will be, time will tell.

Mills: In terms of design, some rockfish and larvae and juveniles are in the water column for four months, and oceanographically, can we really predict where they will be four months from now? Back when I was working on oil spills, I looked at a lot of floater studies and you cant' tell where something is going to be four months later. I mean, you can tell where a preponderance would be, but I would question how well we can connect those two in design. For species that land more locally, that's a distinct possibility and should be a consideration. But I would say that to take it to that level of design, when we're actually getting down to selecting sites, may be premature. I would not be able to stand in front of a group and say, 'I need this site and this site only, not a site that's ten feet away or that's a quarter of a mile away' at the present time. I don't know that the data are behind us to say that one specific site is the site that we need. I'd say that we'll use adaptive management and that what I'd really like is a way to head-tag rockfish eggs and larvae so I can tell where they go to from these sites, because that kind of information will be critical as we move forward, as we are doing adaptive management on these sites.

Q: Is there any attempt to privatize the marine protected areas such as possibly granting a conservation easement I exchange for something like a reduced tax assessment or something. It seems that there could be an awful lot of opportunity there for setting aside property that way and it faces us with reality in terms of how much of the resource out there, in terms of tidelands and shorelines, is actually under private ownership.

Mills: Sixty percent of the tidelands in Puget Sound are privately owned, I believe that's the approximate figure. The Heritage Program under DNR, which is a land-based program, does include things like voluntary set-asides or local privately owned areas that can be designated. There is no connection to a reduction in taxes at the present time. That would have to be passed either by the legislature or by local government to give some kind of tax incentive to do that. The primary focus of marine protected areas in our work has not been the intertidal area. Most of the areas that Mike counts are intertidal, not subtidal. Our main focus has been on the subtidal areas and those at present are under the ownership of DNR.